

Notes on a Spruce-feeding Webspinning Sawfly, *Acantholyda aglaia*
(Hymenoptera, Pamphiliidae), with Description of a
New Subspecies from Hokkaido, Japan

Akihiko Shinohara¹ and Hideho Hara²

¹ Department of Zoology, National Science Museum (Nat. Hist.),
3–23–1 Hyakunin-chô, Shinjuku-ku, Tokyo, 169–0073 Japan

² Hokkaido Forestry Research Institute, Kôshunai, Bibai,
Sorachi, Hokkaido, 079–0198 Japan

Abstract A new subspecies of spruce-feeding webspinning sawfly, *Acantholyda aglaia yezoensis*, is described from Hokkaido, Japan, with brief notes on its immature stages. The nominotypical subspecies is newly recorded from Primorskij Kraj, and the male is diagnosed for the first time.

Key words: Pamphiliidae, *Acantholyda aglaia*, new subspecies, new host record, *Picea abies*, new distribution record.

Acantholyda aglaia Zhelochovtsev, 1968, is a little known species of webspinning sawfly previously recorded from eastern Siberia and the Russian Far East. It was described on the basis of a female holotype from Komsomol'sk-na-Amure in Khabarovskij Kraj and a female paratype from El'niki in Krasnojarskij Kraj (Zhelochovtsev, 1968). Shinohara (1988) synonymized *Acantholyda angarica* Ermolenko, 1969, with *A. aglaia* and gave a short supplementary description based on the examination of the type series of *A. aglaia*. *Acantholyda angarica* was described from a female captured on *Picea obovata* at Motigino in Krasnojarskij Kraj (Ermolenko, 1969). These are the only references to this species published so far.

In the late 1980's a series of specimens of an unidentified *Acantholyda* species was collected in Hokkaido, northern Japan (Higashiura *et al.*, 1992), and the second author succeeded in rearing this species from the eggs laid by a captured female to the mature larvae. The larvae feed on *Picea abies*, a spruce introduced to Hokkaido and now widespread there. Subsequent studies have shown that the Hokkaido specimens belong to *A. aglaia* but should represent a separate subspecies. The first author recently studied a female and a male of *A. aglaia aglaia* from the Russian Far East in the collection of the Swedish Museum of Natural History, Stockholm, and two males of the same subspecies recently collected near Khabarovsk by himself. The female is the first specimen of this species to be recorded from Primorskij Kraj and the male of this species was unknown. In this paper, we will summarize the currently available information on the species and describe the new subspecies from Hokkaido. Unless otherwise indicated, all the material used in this paper is deposited in the National

Science Museum, Tokyo.

The first author thanks Dr. M. Abe, Kyushu Tokai University, Chôyô (MA), Dr. A. V. Antropov, Zoological Museum, Moscow State University, Moscow (MU), Dr. T. Hirowatari, College of Agriculture, University of Osaka Prefecture, Sakai (UOP), Dr. A. S. Lelej and Dr. N. V. Kurzenko, Institute of Pedology and Biology, Vladivostok, Dr. F. Ronquist and Dr. T. Pape, Swedish Museum of Natural History, Stockholm (NRMS), and Dr. M. Suwa, Faculty of Agriculture, Hokkaido University, Sapporo (HU) for making the material available for this study, and we thank Dr. S.-I. Uéno, National Science Museum, Tokyo for reviewing the manuscript. This work is supported in part by the Grant-in-aid for Scientific Research No. 10836021 from the Ministry of Education, Science and Culture, Japan.

***Acantholyda aglaia* Zhelochovtsev, 1968**

[New Japanese name: Tôhi-kiberi-hirata-habachi]

Remarks. *Acantholyda aglaia* belongs to the subgenus *Itycorsia*, which currently contains 13 species in Eurasia (Gussakovskij, 1935; Takeuchi, 1938; Pesarini & Pesarini, 1976; Shinohara, 1985; Achterberg & Aartsen, 1986; Shinohara, 1988; Xiao *et al.*, 1992; Shinohara & Byun, 1996). *Acantholyda aglaia* may be distinguished from the other Eurasian species of *Itycorsia* by the combination of the mostly black head, with pale, impunctate paraantennal fields (Fig. 2 D) each delimited dorsally by a distinct facial crest, entirely black ventral side of the thorax, the strongly infuscated wings, and usually largely brownish (or reddish brown) dorsum of the abdomen in the female, and mostly black, laterally brown abdomen in the male.

A Turkish species, *Acantholyda fumata* Enslin, 1910, known only from the female holotype, which has been examined by the first author (see Blank *et al.*, 1998), is also characterized by the impunctate paraantennal field, the strongly infuscated wings, and mostly reddish brown dorsum of the abdomen. In *A. fumata*, however, the head and thorax are very smooth, polished between sparse, small punctures and the lateral pronotum and lateral part of the mesepisternum are mostly pale yellow. *Acantholyda fumata* is also distinguished from *A. aglaia* by its large size (the length is 17 mm in *fumata* and 11–14 mm in *aglaia*).

Of the 13 Eurasian species of *Itycorsia*, host-plants are known for seven species, of which three are associated with *Pinus*, three including *A. aglaia* with *Picea*, and one with *Larix*. Two other *Picea*-feeding species are *A. peiyingaopaoa* Hsiao, 1963 from Inner Mongolia and *A. piceacola* Xiao & Zhou, 1986, from Gansu, both in China. Unlike *A. aglaia*, *A. peiyingaopaoa* has a largely brownish yellow head and entirely black thorax and abdomen in the female and *A. piceacola* has the entirely dark yellow anterior part of the head (entire clypeus, paraantennal fields and lower part of frons) in the female and largely hyaline, dark-banded wings (Xiao *et al.*, 1992).

Two subspecies are now recognized in *A. aglaia*, the nominotypical subspecies from eastern Siberia and the Russian Far East and *A. aglaia yezoensis* subsp. nov. from Hokkaido, Japan.

***Acantholyda aglaia aglaia* Zhelochovtsev, 1968**

(Fig. 1 A–B, 2 A–B)

Acantholyda aglaia Zhelochovtsev, 1968, p. 50; Shinohara, 1988, p. 514.

Acantholyda angarica Ermolenko, 1969, p. 65.

Distribution. Eastern Siberia (Krasnojarskij Kraj) and the Russian Far East (Khabarovskij Kraj and Primorskij Kraj).

Type material examined. ♀ (holotype; Fig. 1 A–B), “Amur, Komsomolsk, 24. VI. 31, W. Shawrow” (MU). ♀ (paratype), “Sobron, 27/VI 62, lesn. Kul'm. Ur. El'niki Krasn. kra.” (MU).

Additional material examined. 1 ♀ (Fig. 2 A), “g. Sv. Il'iSpas. u. Ussur. kr., 31. VII–1. VIII., 926, D'konv Filip'ev” “*Acantholyda hieroglyphica* Christ, n. var., Malaise det.” (NRMS); 1 ♂ (Fig. 2 B), “[illegible handwriting], 27. VII. 31, Kurentzov” “Siber. or.” “*Acantholyda hieroglyphica* Christ, n. var., Malaise det.” (NRMS); 2 ♂, Sosninskij River, 5 km SW of Bychikha, Bol'shehekhtsirskij Reserve, Khabarovskij kraj, 15. VI. 1994, A. Shinohara.

Variation. The four known females vary in length from 12 to 14 mm (Ermolenko, 1969, gave 12 mm in the key but 11 mm in the description) and show small variation in color pattern; the clypeus is often marked with dark brown and the vertex often has a dark brownish or yellowish white spot along the lateral suture (Fig. 2 A; see also Fig. in Ermolenko, 1969). The Ussuri specimen has 32- and 33-segmented antennae, with the 3rd segment about 2.3 times as long as the 4th. In the holotype of *angarica*, the antenna is 35-segmented, with the 3rd segment about 2.7 times as long as the 4th (Ermolenko, 1969), and in the holotype and the paratype of *aglaia* the 3rd antennal segment is about 2.7 and 2.6 times as long as the 4th, respectively (Shinohara, 1988).

The three males examined range from 11.5 to 12 mm in length and vary little in coloration. The pale marking at median anterior margin of the clypeus is almost missing in one specimen. The cell C of the forewing is glabrous in one specimen. Four intact antennae of two specimens have 31 (1 antenna), 32 (1 antenna) and 33 (2 antennae) segments; the 3rd segment is about 2.1 to 2.3 times as long as the 4th in three specimens. The stub of the crossvein m+cu-a in the forewing and the stub of the vein 2A in the hindwing are absent or nearly so.

Host-plant. The holotype of *A. angarica* was collected from *Picea obovata* and Ermolenko (1969) surmised that it was a probable host-plant.

Remarks. This nominotypical subspecies was known only from three specimens, namely the type series (two females) from Krasnojarskij Kraj and

Khabarovskij Kraj and the female holotype of *A. angarica* from Krasnojarskij Kraj (see introduction). I have examined four more specimens listed above, one of them, a female, representing the first record from Primorskij Kraj and the other three being the first male specimens ever recorded.

The male agrees with the description of the male of *A. aglaia yezoensis* given below (see also notes on the variation given above), except as follows: The pale yellow area on the clypeus is smaller, occupying only the anterolateral corners and often the anterior margin, and disconnected from pale area on the paraantennal field (Fig. 2 B); the malar space is largely black; the yellow marking on the mesoscutal median lobe is rather small; the fore coxa is entirely black; the antennae have 31–33 segments, with the 3rd segment about 2.1–2.3 times as long as the 4th; the cell C of forewing is often glabrous or nearly so.

Acantholyda aglaia yezoensis subsp. nov.

(Figs. 1 C–I, 2 C–F, 3)

Acantholyda sp. 1: Higashiura *et al.*, 1992, p. 18.

Female (holotype). Length about 12.5 mm. Forewing length about 12 mm. Head black, with broad anterior margin of clypeus, large spot covering paraantennal field, spot at upper margin of inner orbit, and large but rather obscure paired spots along each lateral suture pale yellow (Fig. 2 C); posterior margin of postocular area and lower part of gena each with obscure pale brownish marking; mandible pale yellow, becoming dark ferruginous towards apex, medially with obscure blackish marking; antenna pale brown, becoming blackish towards apex; scape very obscurely marked with blackish brown. Thorax black, with tegula, posterior half of mesoscutal median lobe, spot in posterior part of mesoscutal lateral lobe, most of mesoscutellum, and elongate spot on metascutellum pale yellow. Legs black, with very narrow apical margins of trochanters, apices of femora, and entire tibiae and tarsi pale brown. Wings strongly infuscated except for weakly infuscated cell R and basal halves of cells 1Cu and 1A in forewing; stigma blackish brown, with apical 1/3 (except for anterior and posterior margins) pale brown; veins blackish brown, with veins C and Sc pale brown. Abdomen black, with rather broad lateral margins of dorsum, broad posterior margins of 2nd to 5th terga, entire laterotergites, and narrow posterior margins of other abdominal segments more or less brown.

Head with sharp postgenal carina laterally; vertex (postocellar area) about 0.98 times as long as anteriorly wide; transverse suture recognizable laterally; lateral transverse and coronal sutures indistinct; frons very weakly raised; ocellar basin very small and shallow; median fovea in front of shallow furrow-like depressions; facial crest rather strongly raised, very bluntly carinate; frontal tubercle low between antennae; clypeus roundly swollen medially, about as high as frontal tubercle in lateral

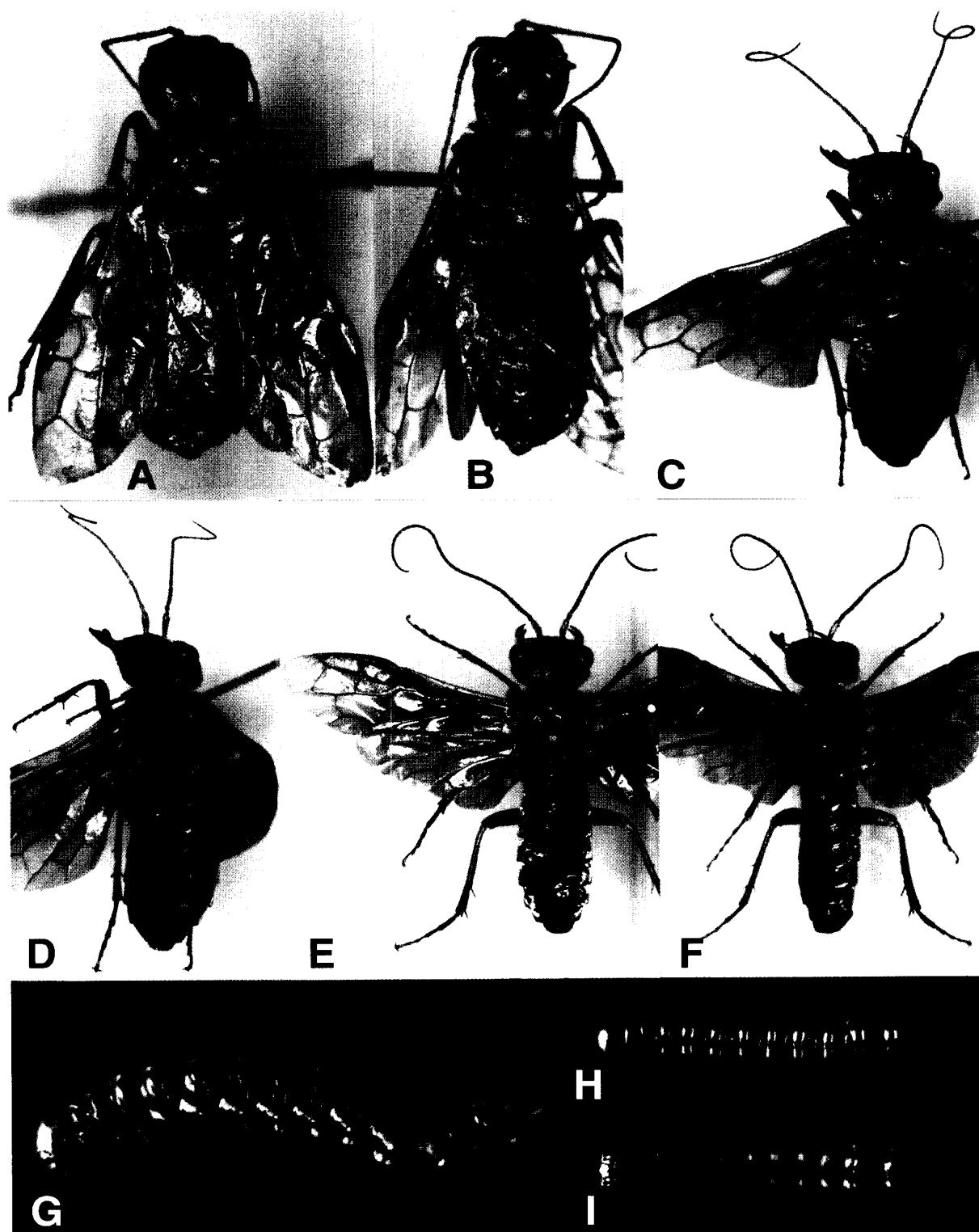


Fig. 1. *Acantholyda aglaia* Zhelochovtsev, 1968, ♀, holotype, photographed in 1987 (A–B), *A. aglaia yezoensis* subsp. nov., ♀, holotype (C–D), do., ♂, paratype, Bibai (E–F), do., mature larva, photographed on July 9, 1988, at Bibai (G–I). A, C, E, H, Dorsal views; B, D, F, I, ventral views; G, lateral view.

view. Head behind level of transverse and lateral transverse sutures and upper part of gena with rather narrowly spaced, usually medium-sized, distinct punctures, interspaces rather smooth; area from level of lateral transverse suture to facial crest with shallow, partly confluent punctures, more or less rugose or rather smooth between punctures; frons with ocellar area covered with dense, small punctures, and below this area, with large nearly impunctate area surrounding median fovea; paraantennal field entirely smooth, without distinct punctures; clypeus with rather sparse, small to medium-sized punctures, interspaces rather smooth, dorsolateral part weakly transversely rugose; lower part of gena coarsely and irregularly rugose. Punctures on head bearing rather short dark-colored hairs.

Right antenna with 33 segments and left one with 31; 3rd segment about $2.2\times$ length of 4th. Forewing with cell C sparsely pilose and stub of $m+cu-a$ very short; hindwing with apical stub of 2A present. Abdominal segments coriaceous, weakly shining.

Male (paratype from Bibai). Length about 12 mm. Forewing length about 9.5 mm. Head black, with large pale yellow marking (Fig. 2 D) covering entire clypeus, paraantennal field, supraclypeal area, inner orbit, malar space and anterior half of lower part of gena; mandible pale yellow, becoming dark ferruginous towards apex; antenna pale brown, becoming blackish towards apex, with scape and pedicel pale yellow. Thorax black, with very obscure marks at posterolateral corner of dorsal part and at ventral margin of lateral part of pronotum, tegula, posterior half of mesoscutal median lobe, most of mesoscutellum, and elongate spot on metascutellum pale yellow. Legs black, with small spot at apex of fore coxa, very narrow apical margins of trochanters, apices and anterior surfaces (except for basal parts) of femora, and entire tibiae and tarsi pale brown. Wings uniformly strongly infuscated; stigma blackish brown, with apical $1/3$ (except for anterior and posterior margins) pale brown; veins blackish brown, with veins C and Sc pale brown. Abdomen black, with rather broad lateral margins of dorsum, entire laterotergites, and posterior margins of sterna, and most of subgenital plate pale brown; genitalia blackish brown with harpes pale brown.

Head with transverse suture distinct; lateral transverse and coronal sutures indistinct; frons weakly raised, with low median crest running from place of median fovea to anterior part of clypeus very distinctly lowered (interrupted) at epistomal suture in lateral view; ocellar basin rather large and distinct, with anterior and posterior notch-like extensions; median fovea shallow, furrow-like; facial crest rather strongly raised, carinate; clypeus roundly, rather weakly swollen medially, about as high as frontal tubercle in lateral view. Punctuation and pilosity of head as in female.

Both antennae 38-segmented; 3rd segment about $2.5\times$ length of 4th. Forewing with cell C very sparsely pilose and stub of $m+cu-a$ very short; hindwing with apical stub of 2A absent. Abdominal segments smooth, partly coriaceous, shining. Subgenital plate broadly rounded apically. Genitalia as in Fig. 3; “additional lobe” of dis-



Fig. 2. *Acantholyda aglaia aglaia* Zhelochovtsev, 1968 (A-B) and *A. aglaia yezoensis* subsp. nov. (C-F), heads. — A, ♀, "Ussur. kr."; B, ♂, "Siber. or."; C, ♀, holotype; D, ♂, paratype, Bibai; E, do., a dark specimen; F, ♀, holotype, paraantennal field.

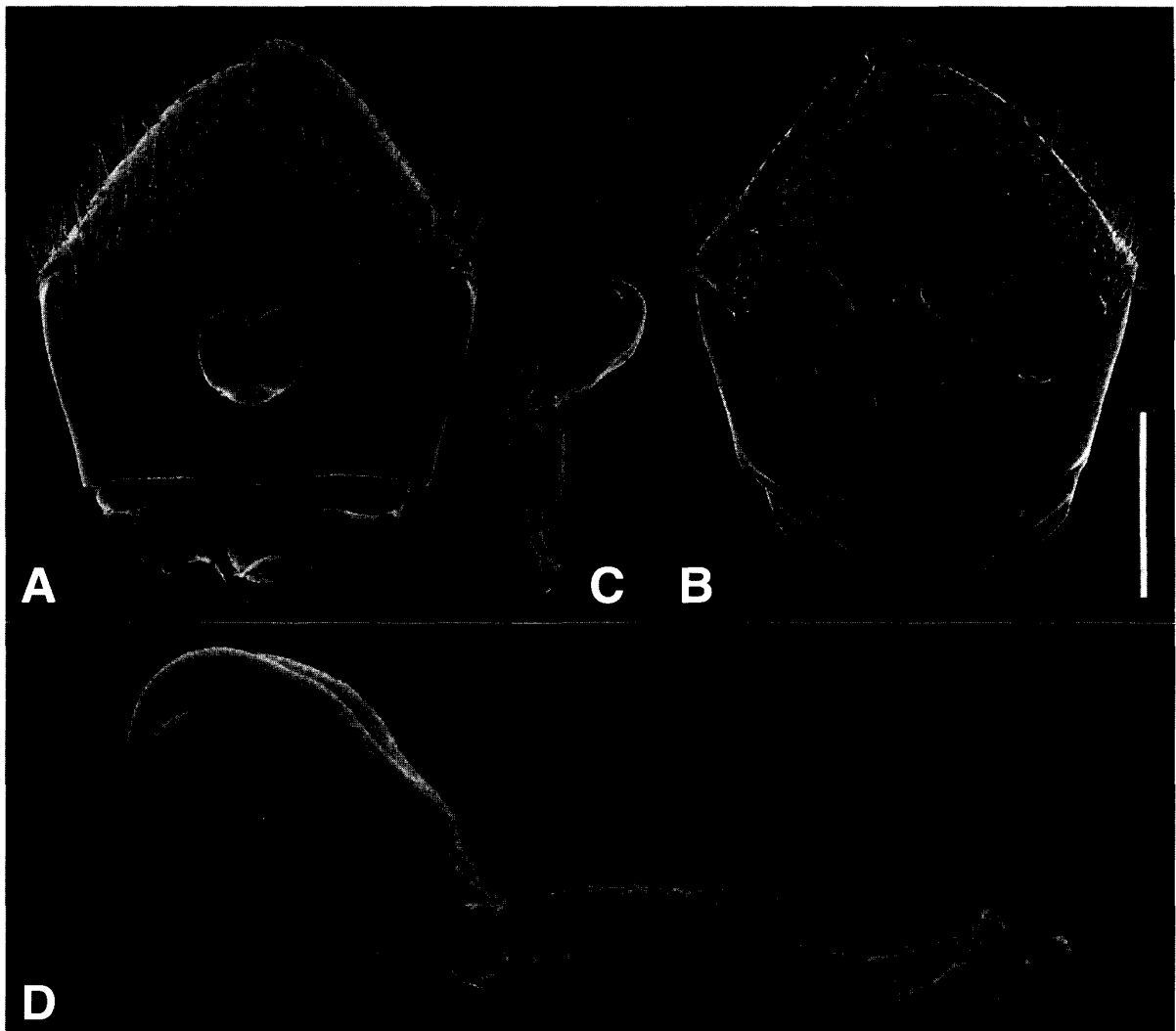


Fig. 3. *Acantholyda aglaia yezoensis* subsp. nov., ♂, paratype, Bibai, genitalia. A, Dorsal view; B, ventral view; C–D, penis valve, lateral view. Scale: 0.5 mm for A–C, 0.17 mm for D.

tivolsella (Eidt, 1969) present.

Distribution. Japan (Hokkaido).

Holotype: ♀, Toyotaki, nr. Jôzankei, Ishikari Co., Hokkaido, swept from *Picea abies*, 26. VI. 1986, A. Shinohara.

Paratypes: 1 ♀, 1 ♂, Shirataki, Abashiri Co., Hokkaido, swept from *Picea abies*, 24. VI. 1986, A. Shinohara; 1 ♂, Mt. Oakandake, Akan, Kushiro Co., 10. VII. 1928, H. Kono & C. Watanabe, "*Acantholyda pinivora* Enslin, det. Takeuchi" (HU); 1 ♀, Nukabira, Tokachi Co., Hokkaido, 13. VI. 1954, M. Sasakawa, "*Acantholyda costalis* sp. nov." (UOP); 1 ♂, Bibai, Sorachi Co., Hokkaido, swept from *Picea abies*, 29. V. 1988, H. Hara; 1 ♀, same data, except for 31. V. 1988; 2 ♂, same data, except for 2. VI. 1988; 6 ♂, same data, except for 6. VI. 1988; 4 ♂, same data, except for 8. VI.

1988; 1 ♂, Nopporo, Ishikari Co., Hokkaido, 8. VI. 1985, M. Abe (MA); 1 ♀, same data as for holotype.

Variation. The females range in length from 12 to 14 mm. The head color pattern is fairly stable; the pale mark along lateral suture and the pale mark along posterior margin of postocular area are obsolete in a paratopotype. Rather narrow posterior margin (medially interrupted) of dorsal part of the pronotum is pale yellow in all paratypes. A pale spot on the mesoscutal lateral lobe is fading in a paratopotype. Coloration of the dorsum of the abdomen is variable; paratypes from Nukabira and Bibai are similar to the holotype, but a paratype from Shirataki has the dorsum mostly blackish brown to black, with lateral margins brown, whereas a paratopotype has the dorsum brown, with only the propodeum and 7th to the last segments largely black. Number of the antennal segments is variable; the paratype from Bibai has 37 segments on both sides, two specimens (holotype and paratype) from Toyotaki have 31 (1 antenna) and 33 (3 antennae) segments, and the paratype from Shirataki has 28- and 29-segmented antennae. The 3rd antennal segment is about 2.2 to 2.6 times as long as the 4th. The cell C in the forewing is constantly pilose. The stub of the crossvein m+cu-a is absent or present but very short, and the stub of the vein 2A in the hindwing is always present.

The males vary in length from 10.5 to 13 mm. The pale yellow area on the clypeus is sometimes smaller, occupying only the anterior half, disconnected from the pale area on the paraantennal field (Fig. 2 E), and the malar space is largely black. The yellow spot on the mesoscutal median lobe is often obsolete or missing. The yellow spot on the fore coxa is often missing. The pale marking on each abdominal sternum, including the subgenital plate, often becomes reduced. A total of 30 antennae are intact and they have 32 to 38 segments (28 antennae have 35 to 38 segments); the 3rd segment is about 2.3 to 2.6 times as long as the 4th. The cell C in the forewing is constantly pilose, but often very sparsely so and in a few specimens it is nearly glabrous. The stub of the crossvein m+cu-a is absent or present but very short, and the stub of the vein 2A in the hindwing is usually absent, though faintly indicated in a few cases.

Host-plant. *Picea abies*.

Etymology. The specific name is after Yezo (also spelled Ezo, Jezo or Jesso), an old name of Hokkaido.

Biology. The second author reared this species from the eggs to the mature larvae in the laboratory. A female was swept from the foliage of *Picea abies* on May 31, 1988, in the yard of Hokkaido Forestry Research Institute, Bibai. The female was kept in a plastic container with a twig of *Picea abies* and she laid 12 eggs in the period from May 31 to June 6. The banana-shaped, yellowish white egg was laid singly on a current year needle at about 1/3 from the apex. The larvae began to hatch on June 15. The larva lived solitarily and made a coarse web-nest between small twigs or needles with brownish silk. No frass was attached and no conspicuous silk-tube shel-

ter was formed. The larvae fed on current year needles, though final instar larvae also fed on old needles. They reached maturity by the middle of July. The final instar larvae were about 19 mm (male?) or about 24 mm long (female?) and had the head pale brown and the thorax and abdomen dark greenish brown, with yellowish white and blackish marking (Fig. 1 G–I). The larvae became almost entirely greenish when fully matured.

Remarks. In females, this new subspecies is distinguished from the nominotypical subspecies by having the paraantennal field yellow, the clypeus with distinct yellow marks, the antennal scape mostly pale brown, the mesoscutal lateral lobe usually posteriorly marked with pale yellow, the stigma with apical 1/3 pale brown, and the hind tibia mostly pale brown; in *A. aglaia aglaia*, the paraantennal field is brownish, the clypeal marking is often reduced to an obscure brownish spot at each lateral margin or even missing, the antennal scape is mostly blackish, the mesoscutal lateral lobe has no pale marking, the stigma gradually becomes paler apically, and the hind tibia is blackish brown, except for both ends which are pale. In males, the three known specimens of the nominotypical subspecies have a darker color pattern on the head than *A. aglaia yezoensis*; the former has only the anterior margin and anterolateral corners of the clypeus pale yellow (Fig. 2 B), whereas even the darkest known specimen of the latter subspecies (Fig. 2 E) has the anterior half of the clypeus pale yellow.

References

- Achterberg, C. van & B. van Aartsen, 1986. The European Pamphiliidae (Hymenoptera: Symphyta), with special reference to the Netherlands. *Zool. Verh.*, (234): 1–98.
- Blank, S. M., A. Shinohara & A. Taeger, 1998. Revisionary notes on Pamphiliid sawflies (Hymenoptera, Symphyta: Pamphiliidae). *Mitt. Mus. Nat. kd. Berl., Dtsch. entomol. Z.*, **45**: 17–31.
- Eidt, D. C., 1969. The life histories, distribution, and immature forms of the North American sawflies of the genus *Cephalcia* (Hymenoptera: Pamphiliidae). *Mem. ent. Soc. Can.*, **59**: 1–56.
- Ermolenko, V. M., 1969. New species *Acantholyda angarica* sp. nov. (Hymenoptera, Pamphiliidae) from central Siberia. *Zb. prac Zool. muz., Kiev*, **33**: 64–68. (In Ukrainian with English summary.)
- Gussakovskij, V. V., 1935. *Chalastogastra* (pt. 1). Faune de l'URSS (n. s. 1), Insectes Hyménoptères, II (1). XVIII+453 pp. Édition de l'Académie des Sciences de l'URSS, Moscou, Leningrad. (In Russian with German summary.)
- Higashiura, Y., H. Hara & T. Kikuchi, 1992. [Development of the technic for forecasting the mass occurrence of insect pests on *Picea glehnii*.] *Annual Rep., Hokkaido Forestry Res. Inst.*, **1991**: 17–18. (In Japanese.)
- Pesarini, C. & F. Pesarini, 1976. Materiali per un catalogo degli Imenotteri Sinfiti italiani. I. Famiglia Pamphiliidae (Hymenoptera). *Boll. Soc. ent. ital.*, **108**: 53–66.
- Shinohara, A., 1985. Two new species of Cephalciinae from Japan (Hymenoptera, Pamphiliidae). *Kontyû, Tokyo*, **53**: 90–96.
- Shinohara, A., 1988. Notes on *Acantholyda aglaia* (Hymenoptera, Pamphiliidae), with new synonymy. *Kontyû, Tokyo*, **56**: 514.
- Shinohara, A. & B. K. Byun, 1996. Conifer-feeding web-spinning sawflies of the genus *Acantholyda* (Hy-

- menoptera, Pamphiliidae) from Korea. *Insecta koreana*, **13**: 91–104.
- Takeuchi, K., 1938. A systematic study on the Suborder Symphyta of the Japanese Empire (I). *Tenthredo*, **2**(2): 173–229.
- Xiao, G.-r., X.-y. Huang, S.-z. Zhou, J. Wu & P. Zhang, 1992. Economic Sawfly Fauna of China (Hymenoptera, Symphyta). 226 pp. Tianze Eldonejo, Beijing. (In Chinese.)
- Zhelochovtsev, A. N., 1968. Novye vidy Symphyta (Hymenoptera) fauni SSSR. *Sb. Trud. zool. Muz. MGU*, **11**: 47–56.